N61165.AR.004484
CNC CHARLESTON
5090.3a

GROUNDWATER SAMPLING AND ANALYSIS PLAN AREA OF CONCERN 633 (AOC 633)

CNC CHARLESTON SC

8/22/2002

NAVAL FACILITIES ENGINEERING COMMAND

AOC 633 Zone G

Groundwater Sampling and Analysis Plan (RO)

CH2M HILL
3011 S.W. Williston Road
Gainesville, FL
32608-3928
Mailing address
P.O. Box 147009
Gainesville, FL
32614-7009
Tel 352.335.7991
Fax 352.335.2959

CH2MHILL

August 22, 2002

Mr. David Scaturo
South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Re: Groundwater Sampling and Analysis Plan for AOC 633, Zone G

Dear Mr. Scaturo:

Enclosed please find four copies of the Groundwater Sampling and Analysis Plan (SAP) for AOC 633 in Zone G of the Charleston Naval Complex (CNC). This SAP has been prepared to complete the RCRA Facility Investigation (RFI) activities and to provide information that can be used to make decisions regarding the need for corrective measures at the site.

The principal author of this document is Bill Elliott. Please contact him at (352) 335-5877, extension 2477, if you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

cc: Rob Harrell/Navy, w/att
Gary Foster/CH2M HILL, w/att

Groundwater Sampling and Analysis Plan

AOC 633, Zone G

Charleston Naval Complex
North Charleston, SC

Prepared for

U.S. Navy Southern Division
Naval Facilities Engineering Command

Prepared by

CH2M-Jones

August 2002

Contract N62467-99-C-0960

Contents

Acronyms and Abbreviations

AOC	Area of concern
CIP	Charleston International Ports Authority
CMS	Corrective Measures Study
CNC	Charleston Naval Complex
CSAP	Comprehensive Sampling and Analysis Plan
DMP	Data Management Plan
EnSafe	EnSafe Inc.
EPA	U.S. Environmental Protection Agency
ft bls	Feet below land surface
IDW	Investigation-derived waste
IM	Interim measure
LNAPL	Light non-aqueous phase liquid
PCB	Polychlorinated biphenyl
PPE	Personal protective equipment
PVC	Polyvinyl chloride
QAP	Quality Assurance Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SCE&G	South Carolina Electric and Gas Company
SVOC	Semivolatile organic compound
VOC	Volatile organic compound

1.0 Introduction

This document presents a technical approach to evaluate groundwater quality impacts from a former electrical substation, Area of Concern (AOC) 633, in Zone G of the Charleston Naval Complex (CNC). The Zone G RCRA Facility Investigation (RFI) and subsequent Interim Measure (IM) work identified surface and subsurface soils containing polychlorinated biphenyls (PCBs), as well as the presence of a light non-aqueous phase liquid (LNAPL) identified as weathered diesel fuel at the water table interface. Although remediation of soils at the site has been completed, no monitoring wells exist to assess soil impacts to site groundwater.

1.1 Purpose of the Sampling and Analysis Plan

This Groundwater Sampling and Analysis Plan (SAP) presents a proposed approach to evaluate shallow groundwater quality at AOC 633 with the installation and sampling of four monitoring wells in the vicinity of the site. Three monitoring wells will be installed around the perimeter of the site, and one well will be installed in an area where LNAPL was discovered. The four new wells will be developed, surveyed and sampled for PCBs, voltile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. The results of this investigation will be utilized to develop a Corrective Measures Study (CMS) Work Plan for site groundwater.

1.2 Monitoring Well Installation and Development

Four new permanent shallow monitoring wells will be installed at AOC 633 to evaluate groundwater quality impacts from past operations, and to determine the local flow direction of the shallow aquifer at this location with water level measurements. The proposed well locations are shown on Figure 1. One monitoring well will be positioned inside the fenced area near the west end of the concrete slab, where LNAPL was previously observed. Three other monitoring wells will be positioned outside the fence; one well on the north side between Hobson Avenue and the concrete sidewalk; the remaining two wells will be positioned near the southwestern and southeastern fence corners. Although regional shallow groundwater flow directions are believed to be generally to the north-northeast in this area, local groundwater flow may have a southward component, as evidenced by a

small wetland a few hundred feet to the south which contains standing water and wetland plant species.

Positioning the three perimeter wells as proposed will allow for downgradient groundwater quality monitoring with at least one well, regardless of whether local groundwater flow is to the north or south.

The monitoring wells will be installed by a driller licensed in South Carolina, using hollow stem auger drilling techniques. The wells will be constructed of 2-inch diameter, flush threaded Schedule 40 polyvinyl chloride (PVC) with a factory slotted screen section and bottom point. The wells will be completed flush with existing grade, using a water valve cover with locking cap. The screen length will be 10 feet, with the top of the screen positioned approximately 1 to 2 feet above the water table, to ensure that LNAPL monitoring can also be conducted if needed. The total well depths will be approximately 13 to 14 feet below land surface (ft bls).

The wells will be developed prior to sampling, and a licensed surveyor will determine the top of casing elevation and horizontal location of each new monitoring well. The station IDs for the four new wells will be: G633GW001, G633GW002, G633GW003, and G633GW004.

In accordance with R.61-79.265 Subpart F of the South Carolina Hazardous Waste Management Regulations and R.61-71 of the South Carolina Well Standards and Regulations, a request for well installation must be submitted to the South Carolina Department of Heath and Environmental Control (SCDHEC) two weeks prior to the scheduled activity. The written request will include the purpose and construction details of the monitoring wells, and will provide a map of the proposed locations.

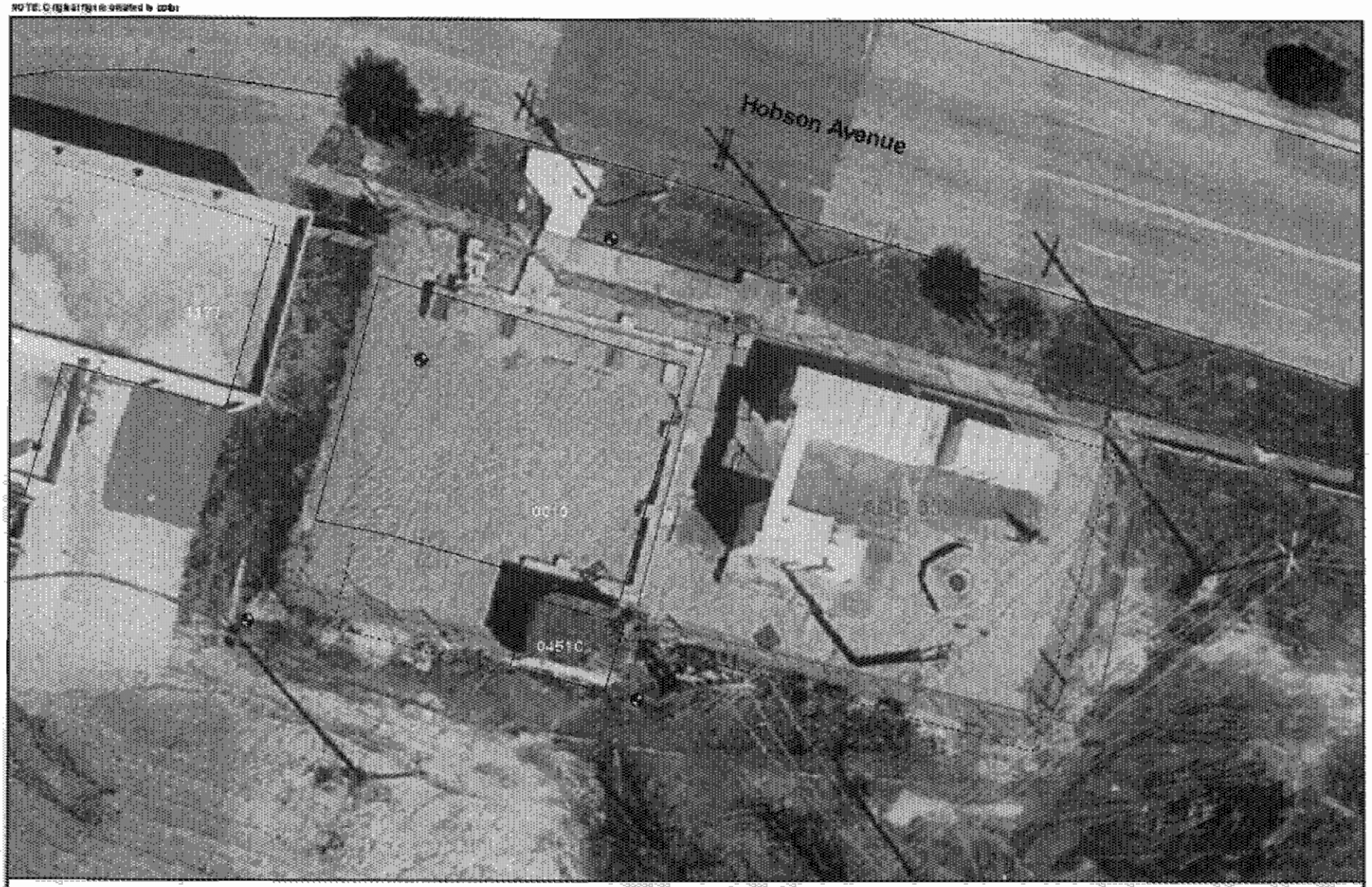
1.3 Organization of the Sampling and Analysis Plan

This Groundwater SAP consists of the following sections, including this introductory section:

1.0 Introduction – Presents the purpose of the SAP and background information relating to the proposed sampling.

2.0 Proposed Sampling and Analysis – Describes the investigate approach for the proposed sampling and analysis of the groundwater at AOC 633.

3.0 References – Lists the references used in this document.



Proposed Monitoring Well Location
Fence
Roads
AOC Boundary
Buildings

N

0 30 60 Feet

1 inch = 25 feet

Figure 1
Proposed Monitor Well Locations
AOC 633, Zone G
Charleston Naval Complex

CH2MHILL

2.0 Proposed Sampling and Analysis

After development of the new wells, the CH2M-Jones field team will purge and sample the four monitoring wells using peristaltic pumps. The static depth to groundwater will be measured prior to purging each well. Monitoring wells will be checked for presence of LNAPL during the water level measurements. If LNAPL is present, the groundwater in that well will not be sampled until the LNAPL has been removed by bailing or pumping. Purge water will be containerized and labeled with the accumulation date and location, and the words "analysis pending."

The groundwater sampling will follow the procedures found in the approved Comprehensive Sampling and Analysis Plan (CSAP) portion of the *Final Comprehensive RFI Work Plan* (EnSafe Inc. [EnSafe]/Allen & Hoshall, 1994). The CSAP outlines all monitoring procedures to be performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents.

Sample quality will be maintained consistent with the procedures identified in the EPA's *Environmental Services Division Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM) (EPA, 1996a).

2.1 Groundwater Sample Analysis

The groundwater samples collected from the new monitoring wells will be delivered or sent via overnight carrier to an offsite laboratory, where they will be analyzed for PCBs using EPA method 8082, VOCs (including dichlorobenzenes) using EPA method 8260, SVOCs by EPA Method 8270, and metals using appropriate SW-846 methods. Trip blanks and equipment blanks will collected and analyzed.

The CSAP also includes the Quality Assurance Plan (QAP) and Data Management Plan (DMP) which will be used to verify that all information and data are valid and properly documented. Sample analysis will be conducted in accordance with the guidance in the EPA's *Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.*, Office of Solid Waste and Emergency Response (SW846) (1996b) and in the EPA Environmental Services Division *Laboratory Operations and Quality Control Manual* (ESDLOQCM) (1997).

2.2 Health and Safety

All work completed under this SAP will be performed in accordance with CH2M-Jones Site-Specific Health and Safety Plan. Personnel working at the site will be required have to comply with EPA Level D personal protective equipment (PPE) requirements, training and medical monitoring requirements as specified in the Project Health and Safety Plan.

2.3 Site Clearance

The proposed monitoring well locations will be flagged or staked in the field in advance of field work, and a utilities location contractor will locate and mark all buried utilities prior to the start of drilling activities. Since the work site is inside the Charleston International Ports Authority (CIP) area gate, CH2M-Jones will coordinate with CIP for site access. The AOC 633 site is also still controlled by the South Carolina Electric and Gas Company, (SCE&G), who will be contacted to open the site gate each day.

2.4 Waste Management and Disposal

Investigation-derived waste (IDW) consisting of development water, sampling purge water, soil cuttings, and equipment decontamination water from the monitoring well installation and development will be collected in labeled 55-gallon drums and transported from the site to Building 1846, located on the CNC. Building 1846 is a RCRA less-than-90-day hazardous waste accumulation area. A sample of the drum contents will be collected and analyzed by the same methods as the field samples to determine proper characterization and disposition of the wastes. If necessary, CH2M-Jones will arrange for the proper transportation and disposal of the drums and their contents to an offsite, licensed facility permitted to accept hazardous waste.

3.0 References

EnSafe Inc. *Zone G RFI Report, Revision 0, NAVBASE Charleston*. 1997.

EnSafe/Allen & Hoshall. *Final Comprehensive RFI Work Plan*. 1994.

U.S. Environmental Protection Agency. Environmental Services Division *Standard Operating Procedures and Quality Assurance Manual* (ESDSOPQAM). 1996a.

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste, SW-846, 3rd ed.*, Office of Solid Waste and Emergency Response (SW846). 1996b.

U.S. Environmental Protection Agency. Environmental Services Division *Laboratory Operations and Quality Control Manual* (ESDLOQCM). 1997.